Amendment to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-35. (Cancelled)

36. (Presently Amended) A system for performing an arthroplasty of a hip joint in a subject having one or more known body characteristics comprising at least body weight, said system comprising:

a reamer having a part spherical head and abrading elements for reaming a socket into an acetabulum of the hip joint until cancellous bone is exposed;

a plurality of prosthetic femoral heads having different radii of curvature that correspond to different predetermined body characteristics including at least body weight such that, when a prosthetic femoral head that corresponds to one or more predetermined body characteristics of a subject including at least body weight is selected and surgically implanted in that subject's body such that it is received within an acetabular socket created by the reamer, a space will exist between the prosthetic femoral head and an inner surface of the acetabular socket and fluid having a hydrostatic pressure in the range of 0.01-5Mpa will accumulate in said space, thereby stimulating the formation of new cartilage between the prosthetic femoral head and the inner surface of the acetabular socket.

37. (Previously Presented) A system according to claim 36, wherein the hydrostatic pressure is in the range 0.5-2MPa.

38. (Previously Presented) A system according to claim 37, wherein the hydrostatic pressure is 2MPa.

39. (Previously Presented) A system according to claim 36, wherein the prosthetic femoral head further comprises:

a membrane which resides between the prosthetic femoral head and the inner surface of the acetabular socket.

40. (Previously Presented) A system according to claim 39 wherein the membrane is resorbable.

41. (Previously Presented) A system according to claim 39 wherein the membrane is formed *in situ*.

42. (Previously Presented) A system according to claim 36, wherein the prosthetic femoral head further comprises:

a spacer element positionable between the prosthetic femoral head and the inner surface of the acetabular socket.

43. (Previously Presented) A system according to claim 42 wherein the spacer element is resorbable.

44. (Previously Presented) A system according to claim 36 wherein said at least one body characteristic comprises, in addition to body weight, at least one additional characteristic selected from the group consisting of:

dimensions of the subject's natural femur; and

dimensions of the subject's pelvis.

45. (Presently Amended) A method for repairing a subject's hip joint, said method comprising the steps of:

(A) determining at least one body characteristic comprising at least the body weight of the subject;

(B) reaming the hip joint's acetabulum until cancellous bone is exposed to create a reamed acetabular socket;

(C) using the at least one body characteristic comprising at least the body weight determined in Step A to select a prosthetic femoral head having a radius of curvature that corresponds to the at least one body characteristic comprising at least the body weight determined in Step A such that, when the selected prosthetic femoral head is surgically implanted within the reamed acetabular socket, a space will exists between the prosthetic femoral head and an inner surface of the acetabular socket and fluid having a hydrostatic pressure in the range of 0.01-5Mpa will accumulate in said space; and

(D) surgically implanting the prosthetic femoral head selected in Step C such that fluid having a hydrostatic pressure in the range of 0.01-5Mpa accumulates in said space, thereby stimulating the formation of new cartilage between the prosthetic femoral head and the inner surface of the acetabular socket.

46. (Previously Presented) A method according to claim 45, wherein the hydrostatic pressure is in the range 0.5-2MPa.

47. (Previously Presented) A method according to claim 46, wherein the hydrostatic pressure is 2MPa.

48. (Previously Presented) A method according to claim 45 further comprising:

positioning a membrane between the prosthetic femoral head and the inner surface of the acetabular socket for at least a period of time.

49. (Previously Presented) A method according to claim 48 wherein the membrane is resorbable.

50. (Previously Presented) A method according to claim 48 wherein the membrane is formed *in situ*.

51. (Previously Presented) A method according to claim 45 further comprising the step of:

positioning a spacer element between the prosthetic femoral head and the inner surface of the acetabular socket for at least a period of time.

52. (Previously Presented) A method according to claim 51 wherein the spacer element is resorbable.

53. (Previously Presented) A method system according to claim 45, wherein the prosthetic femoral head selected in Step C has a surface that deforms so as to sustain the hydrostatic pressure.

54. (Previously Presented) A method according to claim 45 wherein said at least one body characteristic determined in Step A comprises, in addition to body weight, at least one additional characteristic selected from the group consisting of:

dimensions of the subject's natural femur; and

dimensions of the subject's pelvis.

55. (Previously Presented) A reamer device for repairing a subject's hip joint, said device comprising:

a reamer having a rotatable reamer head with a convex distal acetabular-reaming surface and a concave proximal femoral head-reaming surface, said reamer head being i) positionable between the femoral head and the acetabulum of the hip joint and ii) rotatable such that the convex distal acetabular-reaming surface reams the acetabulum and the concave proximal femoral head-reaming surface reams the femoral head, thereby creating reamed, congruent acetabular and femoral head surfaces with a joint space defined therebetween.

56. (Previously Presented) A reamer device according to claim 55 wherein the rotatable reamer head is attachable to and detachable from the distal end of a rotatable shaft such that the shaft without the reamer head attached may be advanced through a tunnel formed in the femur to a position where the distal end of the shaft is between the femoral head and the acetabulum and, thereafter, the reamer head may be inserted between the femoral head and the acetabulum and attached to the distal end of the shaft.

57. (Previously Presented) A system comprising a reamer device according to claim 55 further in combination with a membrane that is disposable within said joint space.

58. (Previously Presented) A system according to claim 57 wherein the membrane is constructed to remain in said joint space permanently.

59. (Previously Presented) A system according to claim 57 wherein the membrane is constructed to remain in said joint space temporarily.

60. (Previously Presented) A system according to claim 57 wherein the membrane is adapted to release a substance selected from the group consisting of: stem cells, chondrocytes and growth factors.

61. (Previously Presented) A system according to claim 55 further in combination with a material that is deliverable into said joint space for *in situ* formation of a membrane in said joint space.

62. (Previously Presented) A system according to claim 61 wherein the membrane formed in said joint space is adapted to release a substance selected from the group consisting of: stem cells, chondrocytes and growth factors.

63. (Previously Presented) A system according to claim 55 further in combination with a gel or gelling substance that is deliverable into said joint space.

64. (Previously Presented) A system according to claim 63 wherein the gel or gelling substance comprises alginate or a hydrogel.

65. (Previously Presented) A system according to claim 64 wherein the gel or gelling substance contains a combination of stem cells, chondrocytes and growth factors.

66. (Previously Presented) A method for repairing a subject's hip joint, said method comprising the steps of:

(A) positioning between the joint's acetabulum and femoral head a rotatable reamer head that has a convex distal acetabular-reaming surface and a concave proximal femoral head-reaming surface; and

(B) rotating the reamer head such that the convex distal acetabular-reaming surface reams the acetabulum and the concave proximal femoral head-reaming surface reams the femoral head, thereby creating congruent acetabular and femoral head surfaces with a joint space defined therebetween.

67. (Previously Presented) A method according to claim 66 wherein the wherein the rotatable reamer head is attachable to and detachable from the distal end of a rotatable shaft and wherein Step A of the method comprises:

forming a tunnel through the femur;

inserting the shaft, without the reamer head attached, through the tunnel to a position where the distal end of the shaft is between the femoral head and the acetabulum;

forming an incision in the joint capsule; and

inserting the reamer head through the incision in the joint capsule and attaching the reamer head to the distal end of the shaft.

68. (Previously Presented) A method according to claim 66 further comprising the step of:

(C) positioning a membrane within said joint space.

69. (Previously Presented) A method according to claim 68 wherein the membrane remains in said joint space permanently.

70. (Previously Presented) A method according to claim 68 wherein the membrane remains in said joint space temporarily.

71. (Previously Presented) A method according to claim 68 wherein the membrane is adapted to release a substance selected from the group consisting of: stem cells, chondrocytes and growth factors.

72. (Previously Presented) A method according to claim 68 wherein Step C comprises delivering into said joint space a material that forms the membrane *in situ*.

73. (Previously Presented) A method according to claim 68 wherein the membrane is adapted to release a substance selected from the group consisting of: stem cells, chondrocytes and growth factors.

74. (Previously Presented) A method according to claim 66 further comprising the step of:

(C) delivering a gel or gelling substance into said joint space.

75. (Previously Presented) A method according to claim 74 wherein the gel or gelling substance comprises alginate or a hydrogel.

76. (Previously Presented) A method according to claim 74 wherein the gel or gelling substance contains a combination of stem cells, chondrocytes and growth factors.